



**PATENT APPLICATION**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re application of

Docket No: Q62053

Nobuyoshi YAGI, et al.

Appln. No.: 09/769,376

Group Art Unit: 1774

Confirmation No.: 5759

Examiner: Tamra DICUS

Filed: January 26, 2001

For: RESIN SUBSTRATE FOR OPTICAL USE

**REPLY BRIEF PURSUANT TO 37 C.F.R. § 41.41**

**MAIL STOP APPEAL BRIEF - PATENTS**

Commissioner for Patents

P.O. Box 1450

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Sir:

In accordance with the provisions of 37 C.F.R. § 41.41, Appellant respectfully submits this Reply Brief in response to the Examiner's Answer dated August 23, 2005. Entry of this Reply Brief is respectfully requested.

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**STATUS OF CLAIMS**

Claims 1 and 3-6 are pending in the application.

Claim 2 was previously cancelled. Claims 1 and 3-6 are rejected.

Claims 1 and 3-6 are being appealed.

**GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

The issues presented for review are as follows:<sup>1</sup>

Whether the Examiner erred in rejecting Claims 1 and 4-5 under the judicially created doctrine of obviousness-type double patenting as assertedly being unpatentable over Claim 1 of U.S. Patent No. 6,500,518 to Sugawa et al.;

Whether the Examiner erred in rejecting Claims 1 and 3-6 under 35 U.S.C. § 102(e) as assertedly being anticipated by U.S. Patent No. 6,500,518 to Sugawa et al.;

Whether the Examiner erred in rejecting Claims 1 and 3-5 under 35 U.S.C. § 102(e) as assertedly being anticipated by U.S. Patent No. 6,136,444 to Kon et al.; and

Whether the Examiner erred in rejecting Claim 6 under 35 U.S.C. § 103(a) as assertedly being unpatentable over Kon et al. in view of U.S. Patent No. 6,261,664 to Beeson et al.

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<sup>1</sup> The Examiner has withdrawn the rejection of Claims 1 and 4-6 under 35 U.S.C. § 112, second paragraph, in the Examiner's Answer.

### **ARGUMENT**

Appellants note the Examiner's indication in the Examiner's Answer that the rejection under 35 U.S.C. §112, second paragraph, is withdrawn in view of Appellants' arguments in the Appeal Brief.

Claims 1 and 3-6 are pending in the application, and a brief summary of each of the claims follows:

Claim 1 is an independent claim drawn to a liquid-crystal cell substrate comprising a multilayer structure. The multilayer structure must have a surface roughness,  $R_a$ , of 0.8 nm or lower on at least one side, and must also have an average thickness of from 100 to 800  $\mu\text{m}$ . The multilayer structure also comprises a layer of a cured epoxy resin as a base layer.

Claim 3 is an independent claim drawn to a resinous multilayer structure for optical use. The resinous multilayer structure comprises a resinous multilayer structure having a surface roughness,  $R_a$ , of 0.8 nm or lower on at least one side and having an average thickness of from 100 to 800  $\mu\text{m}$ . The resinous multilayer structure comprises a layer of a cured epoxy resin as a base layer. The resinous multilayer structure further comprises a transparent hard coat layer having a thickness of 0.1  $\mu\text{m}$  or larger as a surface layer and a poly(vinyl alcohol)-based gas barrier layer as an intermediate layer between the hard coat layer and the base layer.

Claims 4-6 are dependent claims. Each of Claims 4-6 depend from Claim 1.

Claim 4 narrows the range for surface roughness of the liquid crystal cell substrate, reciting that the surface roughness  $R_a$  is 0.2 nm or lower.

Claim 5 narrows the average thickness of the multilayer structure to from 200 to 500  $\mu\text{m}$ .

Claim 6 presents a Markush grouping for the epoxy resin of Claim 1. The epoxy resin is selected from the group consisting of a bisphenol A type epoxy resin, an alicyclic type epoxy resin, and a triglycidyl isocyanurate type epoxy resin.

The crux of the disagreement between Appellants and the Examiner is whether the presently claimed multilayer structure having a surface roughness of 0.8 nm or lower (and 0.2 nm or lower) on at least one side is anticipated or rendered obvious by the prior art of record.

***Response to Double Patenting Rejection and  
Claim Rejection Under 35 U.S.C. § 102 Citing Sugawa '518***

A. Claims 1 and 4-5 are rejected under the judicially created doctrine of obviousness-type double patenting as assertedly being unpatentable over claim 1 of Sugawa et al. (U.S. Patent No. 6,500,518).

B. Claims 1 and 3-6 are rejected under 35 U.S.C. §102(e) as assertedly being anticipated by Sugawa et al. (U.S. Patent No. 6,500,518).

In their Appeal Brief, Appellants explained that claim 1 of Sugawa '518 fails to render obvious, and that Sugawa '518 fails to anticipate, at least Appellants' claimed multilayer structure having a surface roughness, Ra, of 0.8 nm or lower on at least one side.

It is essentially the Examiner's position that Sugawa '518 inherently discloses Appellants' claimed Ra range of 0.8 nm or lower. For example, the Examiner points to claim 1 of Sugawa 518 as reciting "smooth layer", which the Examiner attempts to define by looking to the specification of Sugawa '518 for disclosure of a surface roughness range of 0.2  $\mu\text{m}$  or less, as assertedly overlapping with Appellants' claimed range.

In the Examiner's Answer, the Examiner makes the following statements<sup>2</sup>: "Further, as, evidenced at col. 3, line 40, the smooth surface exhibits a surface roughness value taught within the range of 0.02 micrometers or less, falling within Appellant's range of 0.8 nm and 0.2 nm or lower." And, "The sheet is epoxy (8), is a multilayer structure, and has a smooth surface such as a roughness Ra of 0.02 micrometers or less (meeting Appellant's range of 0.8 and 0.2 nm or lower of instant claims 1 and 4)."

The Examiner reaches the following conclusions: "The Examiner upholds the Double Patenting and 102(e) rejection over Sugawa because patented claim 1 teaches the same epoxy base, thickness range, and claims the sheet is smooth." And, "The Examiner interprets 'Smooth' in light of the specification, which Appellant agrees is 0.02 micrometers or less (20 nm or less) explicitly taught at col. 3, lines 40-41 equating the roughness to the smoothness of a mirror (same as Appellant's teaching within the instant disclosure at page 4, line 2 and page 6, second paragraph)."

Appellants respond as follows to the rejections applying Sugawa '518.

First, the Examiner has systemically and erroneously misapplied certain characteristics of Sugawa '518's elements (and also Kon et al.'s elements) against particular elements of the present invention to suit the Examiner's broad rejections. In other words, the Examiner's application of Sugawa '518's disclosure and teaching is not accurate. Appellants point out such errors below.

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<sup>2</sup> The Examiner makes the following statement: "Regarding the limitation to 'the multilayer structure comprises a layer of a cured epoxy resin as a base layer', Sugawa also provides." However, Appellants point out that this sentence appears to be incomplete and thus cannot be interpreted by Appellants.

Appellants disagree as to the application of Sugawa '518's disclosure at column 3, lines 40-41 of a support, such as stainless steel (see column 3, lines 32-35), having a surface roughness, Ra, range of 0.02  $\mu\text{m}$  or less (20 nm or less) against Sugawa '518's multilayer epoxy optical sheet. The Examiner erroneously believes that Sugawa '518 discloses or teaches a surface roughness range of 0.02  $\mu\text{m}$  or less for at least one side of Sugawa '518's epoxy optical sheet. However, Sugawa '518 fails to disclose or teach any specific Ra range for its epoxy optical sheet, much less the specific Ra range as claimed by Appellants. Thus, there can be no comparison of specific quantitative ranges, including any assertion of overlapping ranges.

Appellants direct the Examiner to the often-cited line from Sugawa '518 at column 3, line 38-41: "For example, an epoxy optical sheet having a mirror surface can be obtained by using a *support* with a surface roughness (Ra) of 0.02  $\mu\text{m}$  or less." (emphasis added). When carefully read, this sentence clearly describes a Ra range for only the *support* in Sugawa '518. However, the support is not even part of the epoxy optical sheet in Sugawa '518. Nothing is disclosed regarding the Ra for Sugawa '518's epoxy resin sheet in this sentence, and no specific Ra value or range is disclosed for Sugawa '518's epoxy optical sheet in this entire reference. Thus, the Examiner cannot apply Sugawa '518's disclosure of its support having a Ra range of 0.02  $\mu\text{m}$  or less against its epoxy optical sheet, as these two elements are different and not interchangeable at all.

The Examiner also erroneously believes that the phrase "an epoxy optical sheet having a mirror surface can be obtained" provides the epoxy optical sheet with the *same* Ra range as the support it is formed on. However, such phrase alone does not teach a specific quantitative Ra range for an epoxy optical sheet. Furthermore, the term "mirror surface" is not further defined in the Sugawa '518 specification. Thus, it is improper for the Examiner to apply a specific

quantitative range for the Ra of Sugawa '518's support to Sugawa '518's epoxy optical sheet based on the mere disclosure of "mirror surface".

The Examiner also erroneously applies a quantitative Ra range for Sugawa '518's epoxy optical sheet based on claim 1 of Sugawa '518, reciting an epoxy optical sheet having a "smooth surface". The Examiner points out that the specification can be used to define terms in the claims. Appellants agree that this is the case with an anticipation or obviousness rejection, but maintain that in a double patenting rejection, only the asserted claim should be used in the rejection.

Because Sugawa '518 does not technically define "mirror" or "smooth" in terms of a quantitative surface roughness range, Sugawa '518 fails to expressly, or even inherently, disclose at least Appellants' claimed surface roughness range of 0.8 nm or less on at least one side of the multilayer structure.

Furthermore, Appellants disagree with the Examiner's statement that "Appellant agrees [that 'smooth'] is 0.02 micrometers or less (20 nm or less) explicitly taught at col. 3, lines 40-41 equating the roughness to the smoothness of a mirror". Appellants point out that Appellants' specification as cited by the Examiner at page 4, line 2 and page 6, second paragraph, does not fairly support the Examiner's inference, as terms in Sugawa '518 cannot be defined by looking outside of the four corners of the Sugawa patent to the present specification. Thus, the Examiner's contention that Appellants have conceded the definition of "smooth" is not accurate.

In view of the foregoing, Applicants maintain that claim 1 of Sugawa '518 reciting "smooth surface" as applied by the Examiner in the double patenting rejection fails to render obvious Appellants' specifically claimed Ra range of 0.8 nm or lower on at least one side of the multilayer structure.



Regarding the anticipation rejection under Sugawa '518, Appellants point out that when the Examiner looks to the disclosure of the specification, the Examiner must fairly consider the entire disclosure. In the Examples of Sugawa '518, the disclosure of a "thickness accuracy of  $\pm 40\text{ }\mu\text{m}$  or less" in Examples 1-3 must also be taken into consideration when defining "smooth surface" in Claim 1. Thus, Appellants point to the thickness precision or accuracy of  $\pm 7\text{ }\mu\text{m}$ , as previously presented in the Table and related remarks in Appellants' Appeal Brief (pages 16-18), for rebutting the Examiner's assertion that Sugawa '518's disclosure is the same as the present invention, which assertion Appellants strongly disagree with. In the present invention, because the thickness precision is a small value of  $\pm 7\text{ }\mu\text{m}$ , Ra becomes a smaller value of 0.2 nm.

Thickness precision is significant in understanding that the present invention is an improvement over the disclosure and embodiments of Sugawa '518. As at least the thickness accuracy of Sugawa '518 and the present application are materially different, such difference is at least one distinction allowing a liquid crystal cell substrate of the present invention to achieve improvements, such as satisfactory black displaying and no alignment defects (i.e. no light leakage), over the invention of Sugawa '518. Such improvements can be obtained as reflected in the presently claimed surface roughness range of 0.8 nm or lower.

Furthermore, even if the Board considers that Sugawa '518 teaches a particular range for surface roughness of at least one side of its epoxy optical sheet, Appellants submit that Sugawa '518 actually fails to enable any range of values which would overlap with the presently claimed surface roughness range. And one skilled in the art could not from Sugawa '518 expect to achieve Appellants' claimed Ra range of 0.8 nm or less on at least one side of Appellants' liquid-crystal cell substrate because Sugawa '518 fails to provide for a smaller thickness precision value, which would translate into an improved reduction in an attainable surface roughness range

as presently claimed (see Sugawa '518's examples starting at column 7). See In re Payne, 606 F.2d 303, 314-15 (CCPA 1979) (the prior art did not enable one skilled in the art to produce the now-claimed invention).

Regarding inherency, the Examiner states that "While the roughness value of 0.8 nm is not claimed, it is considered inherent since the same epoxy resin is used in the same manner." The Examiner asserts that Sugawa '518 teaches the same process as Appellants' disclose in the specification on page 6, second paragraph. The Examiner erroneously concludes that, "Thus, this relation proves the exact same process (using a 0.02 micron support to make the epoxy layer of the multilayer structure, airside) is used to make the same product and thus would naturally have the same Ra range." The Examiner also states that "Because the same process, structure, and materials are employed, it must have the same inherent features." However, Appellants disagree with the Examiner's assertion that the specifically claimed surface roughness is inherent to Sugawa '518 as explained below.

Sugawa '518's disclosure can not be described as the "exact same process" as Appellants disclose, and thus cannot be extended to base a conclusion that Sugawa '518's resin layer would "naturally have the same Ra range [as Appellants' claimed Ra range of 0.8 nm or lower on at least one side of a multilayer structure]".

The fact that a certain result or characteristic *may* occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. See MPEP §2112, and In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (reversing rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art). In order to be considered inherent, evidence must be presented by the Examiner to make clear that the missing descriptive matter is necessarily

present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. See Continental Can Co. USA v. Monsanto Co., 948 F.2d 1264, 1268, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991). Thus, the element must be necessarily present, and not just possibly so.

Even though the Examiner believes that Sugawa '518 discloses "epoxy resin used in the same manner", Appellants do not agree that this is the case, as Appellants describe particular characteristics such as, for example, leveling agents (page 17, first full paragraph), viscosity (page 18, first full paragraph), heating conditions and temperature fluctuations during curing (page 18, second full paragraph and page 21, second and third full paragraphs) that are different or omitted from Sugawa '518's disclosure such that Sugawa '518 would not necessarily produce a surface roughness as believed by the Examiner. In fact, there is no evidence that Sugawa '518's disclosure could achieve such a low surface roughness range as presently claimed at all.

Accordingly, Appellants respectfully request reconsideration and withdrawal of the double patenting rejection over claim 1 of Sugawa '518 and withdrawal of the anticipation rejection over Sugawa '518.

***Claim Rejections - 35 U.S.C. §102 and §103 Citing Kon et al.***

A. Claims 1 and 3-5 are rejected under 35 U.S.C. §102(e) as assertedly being anticipated by Kon et al. (U.S. Patent No. 6,136,444).

As explained in Appellants' Brief on Appeal, Kon does not describe the surface roughness of the uppermost layer. It is essentially the Examiner's position that Kon discloses the surface roughness of the uppermost layer. In the Examiner's Answer, the Examiner makes the

following statements<sup>3</sup>: “However, Appellant appears to not have considered the explicit teaching at col. 18, lines 36-40 teaching the aforesaid property is indeed on the uppermost layer- the "air side", which is the same "air side" as Appellant shows in the disclosure (Figure 1, layer).” And “Kon teaches a surface roughness value of 1 nm or less (col. 18, line 37) and 0.5 nm (Example 1) on the air side, which meets "at least one side" and is within Appellants' range 0.8 nm or less.”

B. Claim 6 stands rejected under 35 U.S.C. §103(a) as assertedly being unpatentable over Kon et al. in view of Beeson et al. (U.S. Patent No. 6,261,664).

In the Examiner’s Answer, the Examiner makes the following statement: “It would have been obvious to one of ordinary skill in the art to include a bisphenol epoxy because Beeson teaches it is conventional to use in optical films as cited above.”

Appellants respond as follows.

Kon fails to teach the multilayer structure of the present invention. Appellants point out that the Examiner cites the following three layer structure to be equivalent to Appellants’ claimed multilayer structure: “The structure of an embodiment of Kon (Fig. 3) is in this order: cured epoxy 8 /PVA (g) barrier 4 / transparent plastic 1. See col. 15, lines 2-20.” (see Examiner’s Answer at page 11, seven lines up from the bottom). However, upon closer review, Kon’s disclosure cannot support the Examiner’s understanding. Kon’s Figure 3 actually discloses a five layered multilayer structure, where a transparent conductive layer is the top-most layer of this structure. Furthermore, Kon’s layer 8 which is an organic solvent-resistant layer (or

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<sup>3</sup> The Examiner makes the following statement: “Regarding the limitation to ‘the multilayer structure comprises a layer of a cured epoxy resin as a base layer’, Kon also provides.” However, Appellants point out that this sentence appears to be incomplete and thus cannot be interpreted by Appellants.

protective layer) is an *inside* layer in Kon's multilayer structure. Thus, Kon's disclosed surface roughness values for an inside layer are not relevant to the present invention.

As an outer layer, Kon's transparent conductive layer 9 cannot be applied against Appellants' cured epoxy layer as the Examiner does not assert that Kon's layer 9 is made of a cured epoxy resin, nor does the Examiner assert that Kon discloses a surface roughness value for transparent conductive layer 9 within Appellants' claimed range of 0.8 nm or lower.

In fact, Kon discloses that the transparent conductive layer which is laminated on the solvent-resistant layer is generally a layer of metal such as tin, indium, zinc, etc. or an oxide thereof (see column 18, line 65 to column 19, line 2). The transparent conductive layer is preferably indium-tin oxide or ITO (see column 19, lines 5-8). Thus, Appellants' claimed cured epoxy resin which is used as a base layer is structurally different from Kon's transparent conductive layer.

In any case, Kon's transparent conductive layer still fails to satisfy Appellants' claimed surface roughness range. Kon discloses that surface roughness values for the transparent conductive layer are 4.1 nm (see Example 1, col. 25, lines 28-29), 5.7 nm (Ex. 2), 8.9 nm (Ex. 3), 3.8 nm (Ex. 4), 7.9 nm (Ex. 5), 4.9 nm (Ex. 6), 4.6 (Ex. 7), and 3.8 nm (Ex. 16). Each of these surface roughness values for Kon's outermost layer are outside the scope of Appellants' claimed range of 0.8 nm or lower, and Appellants submit that Kon's disclosure only enables a surface roughness range of between 3.8 nm to 8.9 nm, based on these specifically disclosed values.

Similar to the misapplication of the disclosed surface roughness range in Sugawa '518, the Examiner again appears to have erroneously confused the disclosed surface roughness range of the "airside" of Kon's transparent plastic substrate 1 with the uppermost layer of Kon's multilayer structure. Appellants point to the paragraph at column 18, lines 33-42. Taken in

context, this particular paragraph occurs in the section describing “Transparent Plastic Substrate” (see column 17, line 53 to column 18, line 64). The specific sentence describing a surface roughness is at column 18, lines 35-42, reproduced herein below:

“It is also possible to obtain very excellent surface smoothness, demonstrated by a surface roughness Ra of 1 nm or less on the side of the *sheet* which contacts the air during formation of the *sheet* (hereunder referred to as the ‘air side’), and a surface roughness Ra of only a few nm on the side of the sheet which contacts the supporting belt during formation of the sheet (hereunder referred to as the ‘belt side’).” (emphasis added)

Appellants point out that this passage can be easily misunderstood based on the interpretation of “sheet” above. It appears that the Examiner may be erroneously referring to “sheet” as an abbreviation for Kon’s claimed “transparent conductive sheet”, which is a multilayer structure. Appellants do not agree with the Examiner’s understanding of this passage and point again to the complete context of the passage. Taken in context, the abbreviation for “sheet” refers synonymously to only one layer, the “transparent plastic substrate”, described in this particular section of Kon’s specification. This interpretation is supported by Kon’s disclosure, for example, at column 17, lines 54-55, which describes that “[t]he *plastic substrate* used for the present invention may be any publicly known *plastic sheet*...” (emphasis added); at column 17, line 63, stating “transparent plastic substrate or *sheet*” (emphasis added); and the paragraph at column 18, lines 3-13, mentioning “sheet” or “sheets” five different times referring to the manufacture of “Plastic substrates” or “sheet”. Thus, this cited passage in Kon only describes the formation of the first layer transparent plastic substrate on a supporting belt during

a roll-to-roll production system, where the first layer transparent plastic substrate has a surface roughness of 1 nm or less on the “air side” (which is the side opposite the “belt side”), and does not fairly describe Kon’s final product of a multilayer Transparent Conductive Sheet.

It is also clear from Kon’s embodiments that the “air side” of the transparent plastic substrate having a surface roughness of 1 nm or less is subsequently laminated over, and covered, by additional layers. Thus, the Examiner has erred in applying Kon’s specific surface roughness range of 1 nm or less for Kon’s transparent plastic substrate on the “air side” against Appellants’ claimed at least one side of the multilayer structure.

In view of the foregoing, Appellants maintain that Kon fails to disclose at least one side of a multilayer structure having a surface roughness of 0.8 nm or less, and that the present invention is not anticipated by Kon et al.

Appellants rely on the response to the anticipation rejection of Kon above in responding to the obviousness rejection of Kon combined with Beeson.

Furthermore, the Examiner asserts that “Kon teaches bisphenol A in Example 1, col. 23, line 66, but does not say it is an epoxy resin.” Appellants point out that when described in context Kon’s polycarbonate resin refers to the formation of a transparent plastic substrate, not a cured epoxy resin used as a base layer of the present invention.

Accordingly, Appellants respectfully request reconsideration and withdrawal of the anticipation rejection over Kon et al. and the obviousness rejection over Kon et al. in view of Beeson et al.

REPLY BRIEF UNDER 37 C.F.R. § 41.41  
U.S. Appln. No.:09/769,376

Atty. Docket No. Q62053

**CONCLUSION**

For the above reasons as well as the reasons set forth in Appeal Brief, Appellants respectfully request that the Board reverse the Examiner's rejections of all claims on appeal. An early and favorable decision on the merits of this Appeal is respectfully requested.


Respectfully submitted,

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**23373**

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